THE CHEMIST

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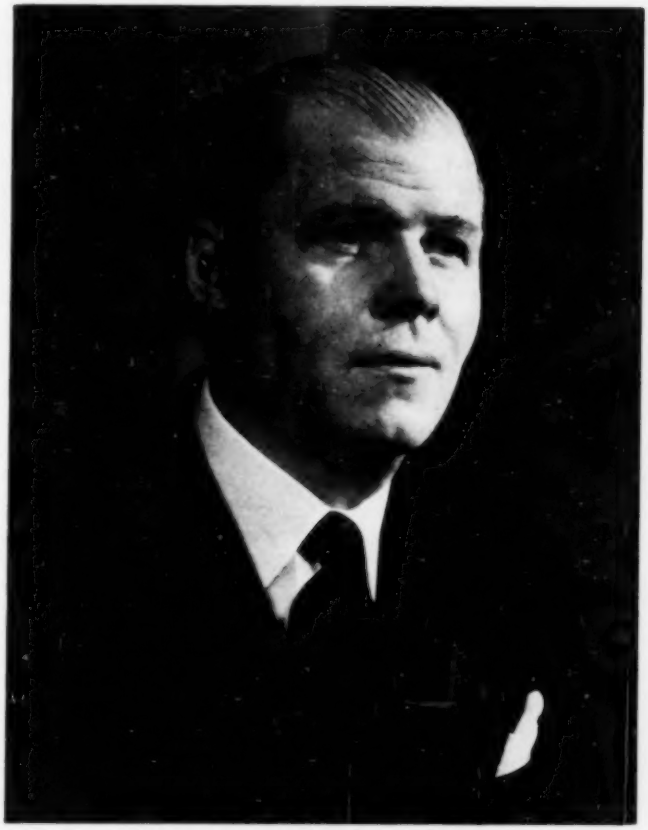

Dr. John E. McKeen, F.A.I.C.
To Receive Honorary AIC Membership
(See page 547)

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Cover Picture

Dr. John E. McKeen, president of Chas. Pfizer & Co., will receive an Honorary Membership in THE AMERICAN INSTITUTE OF CHEMISTS at a meeting of the New York Chapter to be held on January 17th. (See page 582).

Starting with Pfizer as a control chemist, in 1926, Dr. McKeen became superintendent of the firm's Brooklyn plant in 1942. He was elected a vice president in 1945 and assumed the presidency of the company in 1949. In December, 1950, at the age of forty-seven, he was elected chairman of the board of directors, of which he had become a member in 1944.

He was born in New York, N.Y. He received the degree in chemical engineering from the Polytechnic Institute of Brooklyn and immediately joined the Pfizer organization. Later, in 1930, he studied advanced chemical engineering at Columbia University. In June, 1950, St. John's University, Brooklyn, conferred the honorary degree of Doctor of Laws upon him.

Dr. McKeen is a member of the board of directors of the Health Information foundation, the Manufacturing Chemists' Association and the World Medical Association. He is a member of the American Chemical Society, the American Institute of Chemical Engineers, The Chemists' Club, the Metropolitan Long Island Chemical Association, the New York Academy of Sciences, the Newcomen Society, and Sigma Xi. He is active in the Armed Forces Chemical Association, the American Drug Manufacturers' Association, and the American Pharmaceutical Manufacturers Association. He is a member of the board of directors of the Citro Chemical Company and the Polytechnic Research & Development Company.

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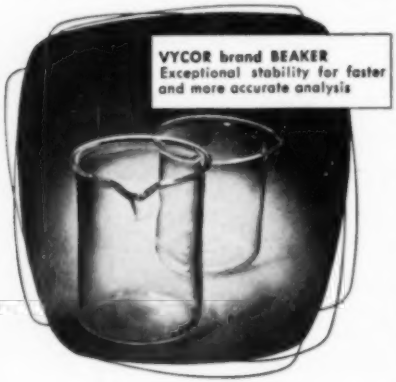

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EDITORIAL

Invention Should Be Taught

Dr. E. C. Hughes, F.A.I.C.

Chief, Chemical and Physical Research Division,
The Standard Oil Company (Ohio), Cleveland 6, Ohio.

INVENTION is one of the main things that industry and government expect of the research profession. The techniques to accomplish this universally-desired objective of research are not taught in any graduate school. There is absolutely no reason to do so, because the graduate school started as a replacement training school for teachers, and its first objective is still to develop teachers. When one discusses the possibility of teaching invention, he is told that it is an art in which the ability is God-given and closely related to the glandular condition in males under thirty-five.

However, the millions of inventions on our books today indicate that many have been able to acquire the art. Psychologists have made great strides in discovering and systematizing the factors underlying such acts of the mind. We should be in a position to start teaching invention and with the teaching will come the development of a science of invention which will make the teaching more effective. The importance of the process of invention should not be underrated. For example, Walter Lippman says in his "Preface to Morals": "A really new thing has come into the world, the invention of invention . . . Men have not merely invented the modern machines . . . They have invented a method of inventing; they have discovered a method of discovery."

Training in making inventions is thus a serious question for our civilization. It is a factor overlooked by those most concerned, who have postulated that the inventions were not being made because fundamental science had been exhausted. Actually the scientific information in any of the major disciplines is so stupendous that Vannevar Bush believes that the rapid location of it can well be the next great scientific tool. Perhaps it is the lack of enough people with a self-taught ability to invent which is holding back advances and not a lack of fundamental science.

Now, Mr. Lippman and others say that the scientific method is the method of invention. The power of the scientific method is certainly one of the greatest of any tools yet devised. Witness the great hullabaloo over "Operations Research" which is the result of "high brass" suddenly and finally discovering the existence

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of this tool. Frank Howard* has pointed out that "the record shows in an environment of organized research . . . the inventive mind reaches a level of productiveness beyond all past experience." Surely one would think there was much attention given to the scientific method in our schools of science. Adequate practice would be required so that in every situation the graduate would automatically apply the method expeditiously and correctly. Recall your school days and you will be lucky if you can think of more than one such instance. Facts, not methods, are being taught because in our inbred system facts are believed to be what a future teacher needs. The framing of the hypothesis is so rarely done by a student, that I have found many graduates who did not realize this was a part of the method of science. Thus, one of the first major changes in a "science profession" curriculum would be increased training on the scientific method . . Nevertheless, while invention thrives in the atmosphere of the scientific method, the low inventive rate of scientific professors is enough to demonstrate that it is not enough to provide the method itself. What are the other factors and who will discover how to teach them?

* The Future of Industrial Research, p. 4. (The Standard Oil Development Co.)

Meeting: Society for Applied Spectroscopy, February 5th, 8:00 p.m. at Socony-Vacuum Training Center, 63 Park Row, New York, N. Y. Subject: Contributed papers by Society Members. Technical Chairman: Dr. J. Allen Wheat, Air Reduction Company.

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Dr. Eduard Farber, F.A.I.C.

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(This timely article covers the present status of the Science Foundation.)

A FEW weeks ago, the National Science Foundation held its second annual meeting at which Chester I. Barnard was elected chairman of the National Science Board to succeed James B. Conant, Hon. AIC., the first chairman of the Board. About one month before this meeting, Congress had appropriated 3.5 million dollars for fiscal 1952. This represented only 25 per cent of the amount requested in the President's budget, but it demonstrated a great advance over the 2 per cent allotted for the first year.

The recommendation to form a National Science Foundation was contained in the report which Vannevar Bush published in July, 1945. This was done in response to President Roosevelt's letter of November 17, 1944. Starting from the "unique experiment of team-work and cooperation in coordinating scientific research and in applying existing scientific knowledge to the solution of the technical problems paramount in war," the President asked for recommendations on how to employ "the lessons to be found in this experiment . . . in times of peace." Extensive discussions followed, hearings were held on a considerable number of bills introduced in the Senate and House, and finally, on May 10, 1950, the new organization was established through Public Law 507. The plan, which Vannevar Bush and his advisory committees had outlined, remained essentially unchanged, except for the budget which, in 1945, had been estimated at 33.5 million dollars for the beginning and 122.5 million for the fifth year of operation. And now, at an inconspicuous house in quiet California Street, close to the center of the nation's Capital, the new organization has begun to function.

"According to Dr. Alan T. Waterman, director of the Foundation, approximately $1,500,000 of the available funds will be allocated for the support of basic research in biology, medicine, mathematics, the physical sciences, and engineering; about $1,350,000 for the training of scientific manpower; and the balance for development of a national policy for the promotion of basic research and education in the sciences, for the wider dissemination of scientific in-

formation, and for other services including support of the National Scientific Register, now established in the Office of Education." (Quoted from a release of November 4, 1951.) Thus, apart from the last-mentioned item, there are three main activities on the program; research grants fellowships, and publications. All three of these activities have formed, and are continuing to form, an essential role in our work in research and education. Private foundations, some of them more richly endowed than the National Science Foundation is at present, are sponsoring men and projects. Scientific societies and private publishers are alert to the task of disseminating information. The question has been raised whether we should welcome more Government aid in a field in which it is already very active.

Such a question may be understood as directed against party politics or dictation in research. The composition of the Board* and the personality of the director offer sufficient reasons for discarding any mistrust in this direction. The most valuable work of our private foundations leaves a wide field for a national foundation. The war effort united large groups of scientists to concerted work; we need a center of unification and coordination in peace. Whether we shall be able to create such a center without paying for it in reduced initiative and freedom will largely depend on those of us who are proposing research projects or who are accepting fellowships. The National Research Foundation sends out a new invitation to basic research, a practical encouragement to work on problems which demonstrate their value within the system of science long before they may take their place in the system of industry or commerce.

Dr. Waterman hopes, as he explained to me, that the stipends for graduate, predoctoral and postdoctoral Fellows will help to increase the number of scientists who may become leaders in their fields. Here, as in the grants for research, it seems to me that opportunities, not prescriptions, are to be given.

A unique scope of services in the dissemination of information is perhaps the hardest task for the National Science Foundation. Is it not true for most of us that, if we were to be judged by the number of scientific publications which have not read, we would appear as rather illiterate? A new publication, of the same kind as those which we are not able to add to our daily program of study, would not be of great help. Our journals

*Members of the National Science Board are: Sophie D. Aberle Chester I. Barnard, Robert Percy Barnes, Detlav Wulf Bronk, James Bryant Conant, Hon. AIC, Gerti Theresa Cori, John W. Davis, Charles Dollard, Lee A. DuBridge, Edwin B. Fred, Paul M. Gross, George D. Humphrey, O. W. Hyman, Robert F. Loeb, Donald H. McLaughlin, George W. Merck, Frederick A. Middlebush, Joseph C. Morris, Harold Marston Morse, Andrey A. Potter, James A. Reyniers, Elvin C. Stakman, Earl P. Stevenson, F.A.I.C., Alan T. Waterman, and Patrick Henry Yancey.

are overcrowded, manuscripts have to wait for publication, and a new journal may relieve the pressure. But what we need, in addition to journals and annual reviews, is a coordination of published results of research and development. We are fortunate in having excellent abstracting journals in chemistry; would it be possible to make the treasures contained in *Chemical Abstracts* more fruitful by a "Chemical Synopsis", and similarly for the other sciences separately or, still more desirable and difficult, for all of them together?

President Roosevelt's letter of 1944 was in part motivated by the desire to create new jobs for the postwar times. The spectre of large-scale unemployment, which loomed large at that time, has been banned; the need for bolstering "small business" by national research, thoroughly discussed in 1945-46 is not very prominent today and has, in effect, been taken over by another "small business", that of consulting chemists and engineers. The National Science Foundation is now the nation's business. As such, some still think it should include the research on the relationships between science and the human society, but this may come at a later time.

Publications in THE CHEMIST concerning the National Science Foundation: Vol. **23**, p. 91 (1946, E. Farber); **27**, p. 359 and **28**, p. 351 (1950 and 1951, committee on National Legislation Affecting Chemists).

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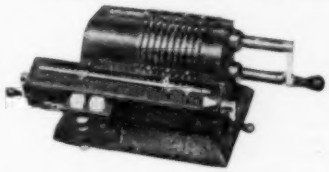

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Honored: Maison deNavarre, F.A.I.C., vice president in charge of manufacturing for Cosmetic Laboratories, Inc. Detroit 2, Mich., who recently received the 1951 medal of the Society of Cosmetic Chemists. In his medal acceptance address, Mr. deNavarre discussed the use of silicones in cosmetic products and asserted that the future would find even more cosmetics compounded with the inert silicones, which act as stabilizers against heat, acidity, alkalinity, or cold.

Zinc Mines: To be reopened in Shasta County, California, by the Glidden Company. The U.S. Government will bear half the cost of exploratory diamond drilling.

Honored: Dr. Vladimir N. Ipatieff, F.A.I.C., director of chemical research for Universal Oil Products Company, Chicago 4, Ill., and director of the Ipatieff High Pressure and Catalytic Laboratory, Department of Chemistry, Northwestern University, by being named a Chevalier of the Cross of Lorraine and Companion of the Resistance, the top distinction of the knighthood. He is the fortieth person and the twelfth American to receive the cross. The French Association of the Knights of Cyprus and Jerusalem has also awarded him its Order, giving him the highest degree after that of the Grossmaster himself, Grand Officer.

Official presentation of the crosses of these Orders will be made when Prof. Albert Caquot, who is president of the Academie des Sciences des l'Institut de France, arrives in this country sometime in the near future. L'Ordre de les Chevaliers de la Croix de Lorraine of France was established in the time of Jeanne d'Arc and later combined with L'Ordre de la Maltic Knights. The Order was re-established after World War II with all honors. The Ordo Cypri Hierosolymorumque is the oldest in the world having been established in the eleventh century.

Dr. Ipatieff was notified that he had been awarded these two high honors of France in recognition of his work in aviation gasoline "which enabled production of a special gasoline, so widely used to win the last war, at the time most critical for France."

Meeting-in-Minature: Scheduled by the New York Section of the American Chemical Society at Hunter College, 68th Street and Park Avenue, New York, N.Y., on February 8th. One-hundred papers in eight different fields of chemistry will be presented in the morning and afternoon, starting at 9:00 a.m. The purpose of this meeting is to reflect the growth of research activities within metropolitan New York. The evening session will be addressed by Major General E. F. Bullene, chief Chemical Corps., Department of the Army, who will speak on "Chemicals in Combat" at Julia Richman High School, 67th Street and Second Avenue, at 8:00 p.m. John Kotrady of The Texas Company is the 1952 chairman of the Meeting-in-Miniature Committee.

Reactivated: Monsanto Chemical Company's program which permits university and college faculty members in chemical engineering to gain a full year's on-the-job experience in the chemical industry. Dr. Carroll A. Hochwalt, F.A.I.C., in charge of technical activities, said the program had been very successful in giving professors practical experience in industrial operations which could be utilized in teaching successive classes of students.

Chemists in Canada

Dr. H. G. Thode

President, The Chemical Institute of Canada

(Presented at the A.I.C. Friendship Dinner, New York, N.Y.)

IT IS a pleasure to bring greetings to THE AMERICAN INSTITUTE OF CHEMISTS from The Chemical Institute of Canada on the occasion of your Friendship Dinner. Our two societies have the same objectives, namely, to advance progress in chemistry and to promote the welfare of chemists and chemical engineers. I, therefore, welcome the opportunity to bring our two societies in closer contact.

We often hear about the thousands of miles of undefended border between our two countries. Perhaps even more noteworthy in the realm of international relations is the ease with which Canadians and Americans can travel back and forth from one country to the other. Because of this close contact with the United States, many Canadian chemists in the past sought positions in American universities and American industries. It has been said that there are more Canadian chemists residing in the United States than there are chemists residing in Canada. Whether this is true or not, we certainly know that there has been a great flow of scientific personnel to the south in the last fifty years. I am happy to inform you that it is no longer necessary for a Canadian chemist to seek a position in the United States—Canadian chemistry is on the march, and there is now a serious shortage of trained personnel.

Perhaps a few words on Canadian chemistry would be in order. For many years Canadians have had somewhat of an inferiority complex with respect to science. Many American companies with plants in Canada were quite happy to confine all research and development to their U.S. laboratories and at the same time Canadian firms were quite willing to leave research and development work to British and U.S. industries. Perhaps this was a natural state of affairs, in view of the fact that Canada was primarily an agricultural country and her industries were, in general, small. However, this situation is rapidly changing. Since World War II, Canada has become a great industrial nation. Her industries are expanding and many are now large enough to support scientific research on a fair scale. In other words, Canada is in about the same position today as the United States after the first World War. Many Canadian industries have not only been sold on the importance of scientific research

and development, but they have come to realize that these activities are important to the Canadian economy. Speaking of selling research to Canadian industries reminds me of the story which is told about two elderly partners in business. These two partners decided to establish a chemical laboratory and hired their first chemist. On the first morning one partner said, "Shall we visit the chemist and see if he has discovered anything yet?" and the second partner said, "No, let's wait until this afternoon". This story hardly applies to Canada today, as Canadians are well aware of the great advances made in the last twenty-five years and of the important part scientific research has played in this advance. Of course, it is inevitable that Canadian chemistry will expand in view of the development of Canadian natural resources and the expansion of Canadian industry.

Many of you have heard of the Aluminum Company of Canada and its great development on the Saguenay River in Quebec. With 2,000,000 horsepower of hydro electric power available, they have built the largest aluminum plant in the world. The new Kitimat development on the Pacific coast in British Columbia will be even larger. There by drilling a tunnel through a mountain, it will be possible to tap a great water shed and make it possible to spill water 2,500 feet to sea level. This is some five times the head of Grand Coulee. The aluminum plant, which is being constructed at this new power site, will have over double the capacity of the Arvida plant when completed. In connection with power development, I do not know whether I dare mention the St. Lawrence seaway in the city of New York. I do not think it is possible for a scientist to stand on the banks of the St. Lawrence at the International Rapids and see the billions of gallons of water flowing down to the sea and not realize that some day this project will be carried out. The general feeling north of the border is that Canada should develop the project on her own. Of course, it should be a joint project between our two countries. It is to be hoped that the United States can still see her way clear to join with Canada in harnessing the St. Lawrence River and in building the St. Lawrence seaway.

I hardly need to tell of the tremendous natural resources of Canada. The iron ore deposits found recently in Quebec and Labrador are among the largest in the world and the 200-mile rail line is being rushed to completion to bring ore to sea level on the St. Lawrence River. The great nickel eruptive at Sudbury in Ontario provides Canada with the largest nickel mine in the world. New mines are being found across Canada daily. These involve deposits of titanium, tungsten, copper, zinc,

uranium and many others. During the past two years many new deposits of pitchblende and uraninite have ben found in the Province of Saskatchewan. A new town is springing up on Lake Athabaska in the northwest corner of Saskatchewan. This town, in the heart of hundreds of uranium mine claims, will probably be known as Uranium City. And finally, I must mention the oil fields of Alberta and possibly Saskatchewan. Alberta with its new oil and gas fields is rapidly becoming known as the Texas of the north. Already sufficient oil has been found to supply almost half of Canada's needs for petroleum products and the surface has only been scratched. The Athabaska tar sands of Alberta alone represent the largest known supply of oil in the world. This new development in Alberta is bringing many chemical industries to the city of Edmonton. A fifty-million dollar plant is being built there by the American Celanese Corporation. Canadian Industries Limited plan a plant to produce polyethylene. A ten-million dollar pumping plant is under way and the oil industry has under construction several refineries and cracking plants. The whole of Canada will, of course, benefit from these developments in Alberta. Pipe lines from the gas fields of Alberta are being planned in all directions—to Vancouver and the Pacific coast, to Ontario and the industrial east, and to Montana and Western United States.

I would be amiss if I did not mention the work of The National Research Council of Canada, of which we are all very proud. The National Research Council of Canada is an unique governmental institution. Under the direction of President C. J. Mackenzie and Vice-president Dr. E.W.R. Steacie, a very excellent balance between pure and applied research is maintained. Recently a system of postdoctorate fellowships was initiated at The National Research Council of Canada. There are now some thirty-two postdoctorate fellows at the Council and some five more at Canadian universities. The present group of fellows come from some twenty-five different Universities in ten different countries. The bringing together of scientists from various parts of the world has already done much to stimulate research in our Canadian laboratories. The National Research Council also operates the famous atomic energy project at Chalk River, Ontario. Here I think Canadians have a right to brag a little. The atomic nuclear reactor at Chalk River has the highest flux or neutron intensity of any pile or reactor in the world. For this reason it is particularly suitable for research purposes. Because of the high flux, it is possible to do experiments in Canada that cannot be carried out

anywhere else. For example, experiments that might require one month of irradiation at Chalk River might require up to fifty months of irradiation in other low intensity piles. Chalk River scientists have made a real contribution to nuclear science and their laboratories are now well-known the world over. The total operating budget of The National Research Council would run about 18-million dollars per year. This would not include capital expenditures for new reactors and the like.

Canadian universities too have played their part in raising the level of chemistry in Canada. Ten years ago only two universities provided work for the Ph.D. degree—McGill and the University of Toronto. Today we have some six universities carrying on work at a Ph.D. level. Our own university — McMaster University in Hamilton, Ontario, has just completed a $750,000 Nuclear Research Building on its campus. Other Canadian universities are providing similar facilities.

Last, but not least, The Chemical Institute of Canada is doing a splendid job. A National Society with some four thousand members, it is now performing the functions that a progressive chemical society should perform. It has its own publications, editorial staff, and provides regional conferences of various kinds for scientists to meet and exchange information. It sponsors speakers' tours across Canada and maintains a close liaison with other chemical societies in other countries. In other words, The Chemical Institute of Canada is a growing concern and will certainly do its part in the development of chemistry in Canada. There is little doubt but that Canadian chemists and chemistry in Canada have a very promising future.

Announced: Dr. Gordon M. Kline, F.A.I.C., as chief of the Organic and Fibrous Materials Division of the National Bureau of Standards. Formerly assistant chief of the Division and chief of the Organic Plastics Section within the Division, Dr. Kline will remain chief of the plastics section for the present. He has been technical editor of *Modern Plastics* and the editorial director of *Modern Plastics Encyclopedia* since 1936. He was born in Trenton, N.J. He received the B.A. degree from Colgate in 1925, the M.S. from George Washington University, and the doctorate degree from the University of Maryland in 1934. He joined the National Bureau of Standards in 1929, where he pioneered in the research on resins which led to the organization of the Organic Plastics Section under his direction in 1935.

Moved: Millmaster Chemical Company to 11 West 42nd Street, New York, N.Y.

Greeting to Those Attending The Friendship Dinner

President Lawrence H. Flett

IT IS a pleasure to welcome the members of the International Congress of Pure and Applied Chemistry and the members of THE AMERICAN INSTITUTE OF CHEMISTS to this Friendship Dinner. Friendship is the universal symbol of the activities of professional organizations represented here.

The objectives of professional organizations, such as our AMERICAN INSTITUTE OF CHEMISTS, are easy to understand. I have often pointed out to you that if chemists worked alone in ivory towers, there would be no need for professional organizations. The ivory tower stood up against the ravages of time throughout centuries of world culture, and now during the recent, few fertile years of scientific advance, it has succumbed to the same wave of progress that obliterated the "little red schoolhouse". As the frontiers of science and chemistry have been pushed back at almost an explosive rate, the proper study of any broad problem has come to require more and more different types of specialized knowledge. Science has become so great that it is not possible for any one individual to know all there is to know, or even to know everything about one particular branch of chemistry. In order to make progress, scientists of different fields must work together. Professional societies seek to make possible that cooperation and to make it fruitful.

This does not mean that chemists must work in the same laboratory or even in the same country. We Americans are indeed indebted to the chemists of other countries, most of whom we have never met in person, for their contributions to the scientific literature. We have used their discoveries as freely as if they were our own. And on our side, every effort has been made to publish scientific information in understandable form so that it is generally available to the chemists of the world at large. It is always a source of fascination to me to see the many authors of chemistry books who are among those present at the meetings of the INSTITUTE.

The world of science has indeed been one world. Neither side of the Iron Curtain has been impervious to the passage of scientific progress. The world of science lives at peace in a world at war, to serve as an example to the less fortunate political world.

Here, the INSTITUTE meets with the representatives of our fellow professional societies and the delegates from foreign countries in a gathering intended to promote those bonds

of friendship which are the symbol of our cooperation in the field of science. The closer those bonds of friendship can be made, even though seas and continents divide, the more rapid will be the march of science.

Chemists are very much the same the world over. Each has an unbounded love and almost blind devotion to science. Many of them have laid down their lives for their science. Most of them have sacrificed careers which would have led to much greater rewards in money and luxury. Many have sacrificed their health so that money, which should have been spent for food and clothing, could be used to provide themselves with precious equipment needed to carry on their research work. All of these things we have seen with our own eyes. Still, those who have spent a lifetime in the halls of science have cherished every moment of it.

We like to think of chemists as a group who maintain the ethical standards that are far above the average. The chemist who lies just once loses his usefulness, because thereafter nobody knows when to believe him and when not to believe him, and so the facts he discloses are worthless. For this reason, chemists have learned the value of a strict code of ethics, and our AMERICAN INSTITUTE OF CHEMISTS requires it.

Nevertheless, there are among chemists, as there are among all people, those who lie and cheat and steal. One of the main objectives of the professional societies represented here is to maintain impeccable standards among our members so that each member may be trusted implicitly.

The INSTITUTE is not a group of crusaders starting out to battle the world for the purity of the science of chemistry; but it is instead a small group dedicated to the highest ethical standards, with whom people can work with implicit trust, and who by practicing those standards can be so successful and make such rapid progress that they can prove to the world that standards in ethics, in cooperation, in friendship and in recognition are a necessary and real part of our profession.

During the more than three years that it has been my privilege to be the president of the INSTITUTE, not one member has been found delinquent by our Committee on Ethics. I pledge to the members of fellow organizations in other countries, and particularly to the members of the Chemical Institute of Canada and the Royal Institute of Chemistry represented here at the speakers table, our sincerest cooperation under the same standards of ethics that we maintain within our own group. By cooperating with you, we strive to do our utmost to advance the science and the profession of chemistry to which we are devoted, and we pledge to you, fellow members of the profession of chemistry, our true friendship.

The Friendship Dinner

Members of THE AMERICAN INSTITUTE OF CHEMISTS gathered at the Friendship Dinner, September 11th, at the Hotel Commodore, to visit with old friends, to meet other AIC members, and to extend a hearty welcome to representatives from Canada and England, to representatives from other professional societies, and to guests.

The Friendly Hour, a gift from the McGraw-Hill Publishing Company, provided pre-dinner refreshments and an opportunity for over two-hundred assembled guests to meet each other. There the officers of the Institute and Dr. Sidney D. Kirkpatrick, F.A.I.C., vice president of McGraw-Hill Publishing, acted as hosts, while the cordial atmosphere was enhanced by the sentimental songs of an accordianist. The AIC members from New York and New Jersey extended a hearty welcome to those members from more distant parts of the country, among whom were: Dr. Howard Adler, Chicago Heights, Ill.; Miss Mary Alexander, Chicago; Mr. and Mrs. H. R. Berlt, Chicago; Paul W. Blume, St. Louis, Mich.; G. D. Creelman, Cleveland, Ohio; Dr. G. J. Esselen, Boston, Mass.; H. R. Hanmer, Richmond, Va.; Dr. W. B. Hendrey, Chicago; Lester F. Hoyt, East Aurora, N.Y.; Dr. V. N. Ipatieff, Riverside, Ill.; G. M. Juredine, Cleveland Heights, Ohio; Dr. Paul Manning, Chicago; Dr. Jane D. Meyer, Greenburg, Pa.; Dr. Walter J. Murphy, Washington, D.C.; Dr. Emil Ott, Wilmington, Del.; Dr. W. G. Parks, Kingston, R.I.; Dr. and Mrs. L. F. Pierce, Los Angeles, Calif.; W. D. Richey, Hiram, Ohio; Dr. Alexander Schwarcman, Buffalo, N.Y.; Dr. Alexander Silverman, Pittsburgh, Pa.; Raymond Stevens, Cambridge, Mass.;Dr. Henry Tauber, Chapel Hill, N.C.; Marvin J. Udy, Niagara Falls, N.Y.; Elbert C. Weaver, Andover, Mass.; Dr. Clyde Williams, Columbus, Ohio; Dr. James R. Withrow, Columbus, Ohio, and John G. Wright, recently of Massachusetts.

Dr. Marston Taylor Bogert, Hon. AIC, and "dean of chemists" attended. Another Honorary Member present, in addition to Drs. Esselen, Murphy, Schwarcman, Silverman, and Withrow, was Jerome Alexander.

AIC President Lawrence H. Flett welcomed those attending the dinner. (See page 563). Dr. Harry G. Thode president of the Chemical Institute of Canada, brought greetings from Canada and gave a brief summary of present chemical industry in our neighboring country. (See page 559). Professor W. H. Linnell, senior vice president of the Royal Institute of Chemistry, conveyed greetings from

England and added some delightful episodes about his visits to New York. Others at the head table were Dr. Henry B. Hass, chairman of the New York AIC Chapter, Dr. R. C. Chirnside, of the Royal Institute of Chemistry, G. T. Page, secretary of the Chemical Institute of Canada, Dr. L. T. Work, AIC president-elect; Dr. F. A. Hessel, AIC treasurer, E. T. Osborne of the Royal Institute of Chemistry, and Dr. Lloyd Van Doren, AIC secretary.

After the dinner, members lingered to continue conversations, "and friendships brightened as the evening waned."

To Philadelphia: Dr. Charles L. Thomas, F.A.I.C., who has joined the Research and Development staff of Sun Oil Company. For the past six years he has been director of Research and Development for the Great Lakes Carbon Corp., Morton Grove, Ill. Previously, he was with Universal Oil Products Company where he did outstanding work on catalysts and catalytic processes for petroleum refining. He has been vice chairman of the Petroleum Division and Chairman of the Chicago Section of the American Chemical Society. He also serves on the advisory boards of *Chemical & Engineering News* and *Industrial & Engineering Chemistry*. He received the B.S. and M.S. degrees from the University of North Carolina and the Ph.D. degree from Northwestern University.

Address for Nobel Prize Winners in Chemistry

Professor Arne Westgren

Chairman of Nobel Committee for Chemistry

(Presented at the Nobel Ceremony in Stockholm Concert Hall, Sweden, December 10, 1951, when Dr. Edwin M. McMillan and Dr. Glenn T. Seaborg, F.A.I.C., received the 1951 Nobel Prize in Chemistry. Published through courtesy of the American-Swedish News Exchange, Inc.)

IN HIS famous treatise on air and fire, published in 1777, Scheele writes that in some quarters at that time it was regarded futile to make any more research into what elements bodies might consist of. "A depressing prospect," he adds, "for those whose greatest pleasure it is to study the substances found in nature." Scheele's own experience and the subsequent developments up to our own day have shown that, at the end of the 18th century, there certainly still was enough to do for those who wanted to discover new elements. At least as many elements as were then known still remained to be discovered.

In 1794, Scheele's friend from his days in Uppsala, the Abo professor Johan Gadolin, published in the proceedings of the Academy of Science a report on a "Study of a black heavy kind of stone from Ytterby Stone Quarry at Roslagen." In this mineral, later called gadolinite after him, he had found a hitherto unknown earth, the so-called yttria. Nine years later Berzelius, in a mineral from Riddarhyttan in Vastmanland (the so-called "Bastnas tungsten") discovered another earth, ceria.

These two discoveries together provided the starting point for studies of the so-called rare earth elements which went on throughout the 19th century. Already Gadolin had reckoned with the possibility that the yttria isolated by him was not a single substance and it proved indeed later to consist of several oxides. Berzelius' ceria also turned out to be a mixture. The separation of the different components in these compound earths has been no easy task, since they are chemically very similar to one another. Little by little, however, it has been possible to divide them up completely, and within this group alone as many as fourteen different elements have been isolated. Swedish chemists, chief among them being Mosander and Cleve, have made very valuable contributions in this domain of chemistry. Of the rare earth metals many—yttrium, terbium, erbium, ytterbium, scandium, thulium, holmium— have been given names that show their origin in various Swedish localities.

Besides this group of closely con-

nected rare earth metals, many other elements were discovered in the course of the 19th century. A comprehensive survey of all the known elements was provided in 1869 by the establishment of the periodic system. At that time, Mendelejeff and Lothar Meyer independently discovered that there were clear evidences of periodicity in the chemical character of the elements when they were arranged in the order of increasing atomic weights. From this regularity, Mendelejeff was able to conclude that certain gaps remained still to be filled, and he could even predict all the most important properties of these still undiscovered elements and their compounds. His predictions have been fully confirmed by later discoveries.

During the years around 1920, Niels Bohr's investigations in the structure of atoms threw new light on the periodic system. It was now possible, among other things, to explain the chemical similarity between the rare earth elements. The positive charge in the nucleus of the atom and the number of electrons surrounding it, rises by one unit for every step upwards in the element series. This additional electron usually forms part of the outermost shell of the atom, and since the chemical characteristics depend on the structure of the atom in just this part, the successive members in the series of elements can for the most part be clearly distinguished from one another in respect to their chemical properties. But within the group of the rare earths it is not the outermost electronic shell that is developed, nor the shell beneath it, but the one that underlies. The result is that, through the whole series of these elements, the exterior parts of the atomic structure remains virtually unchanged. Together they come to what might be called a group of quasi-isotopes. Since they are like lanthanum, the first element in the series, they have been given the comprehensive name of lanthanides.

If, said Bohr, there existed an extension of the series of elements beyond the heaviest of them all, Nr 92, uranium, then this would form a new series of very closely associated elements. They would all resemble uranium and, by analogy with the lanthanides, would form a series of uranides.

By experiments which were carried out during the years 1936-38, Otto Hahn and Lise Meitner believed they could confirm Fermi's statement that the transuranium elements are formed by irradiating the heaviest elements with neutrons. But these synthetic elements were not like uranium, but appeared to be homologues of elements so dissimilar to one another as rhenium, the platinum metals, and gold. Hahn and Strassman made, however, late in 1938 the epoch-making discovery that it was

not really a question of transuranium elements here, at all. The heavy atoms were found to split up into substances belonging to the middle of the elemental series and this brought the whole problem into a new stage.

The first transuranium element of which there was definite proof was produced by McMillan and Abelsson in May 1940 at the University of California, by irradiating uranium with neutrons with the aid of the cyclotron built by Lawrence. It was obtained as a disintegration product of a B-radiating uranium isotope, which has a half life of 23 minutes. Hahn and Meitner had also discovered this body, but their preparation was too weak for its daughter-product to be demonstrated. The Americans were able to investigate this thoroughly, and showed that it forms an isotope of element 93, that is to say, a transuranium element. They called it neptunium after the planet Neptune, whose orbit lies next outward after Uranus in the solar system. By irradiating uranium with rapid neutrons or with heavy-water nuclei, deuterons, other neptunium isotopes were soon produced in Berkeley.

In 1940 McMillan and Seaborg and their fellow-workers had already reported that when neptunium disintegrates it gives rise to an element 94. By analogy with the way in which names had been found for neptunium and uranium, this second transuranium element was called plutonium, after the planet Pluto, which lies next outside Neptune. The first isotope of this element, which has a half-period of 24,000 years and this is relatively stable, is what is called an atomic fuel. This plutonium isotope reacts with slow neutrons in the same way as the uranium isotope U235, that is to say, when it is split it develops great energy and gives off neutrons. In this way it came to play an important part in the atomic bomb project during the war, and methods were developed for its production on a large scale.

After these problems, conditioned by the war, had been solved, Seaborg, as leader of a comprehensive group of able colleagues, completed the studies of the transuranium elements. In doing this, he has written one of the most brilliant pages in the history of the discovery of chemical elements.

Not less than four more transuranium elements have been produced. The chemical characteristics of all these new elements have been established by developing a refined ultra - microchemical experimental technique. Bohr's prophesy that in the transuranium elements we are dealing with a group of substances of the same sort as the rare earth metals, has thus been confirmed. However, this new series of closely associated elements does not begin with 92 uranium, but with 89 actinium. Thus, corresponding to the

lanthanides, there are the actinides, and a certain agreement can be found between every member in these two series. Seaborg therefore proposed, for the new transuranium elements 95 and 96, the names americium and curium, in analogy with their corresponding rare earths europium and gadolinium (after Europe and Gadolin respectively). The two transuranium elements most recently discovered, berkelium and californium, correspond to terbium and dysprosium in the lanthanides.

By irradiating different sorts of heavy atoms with neutrons, protons, deuterons, helium nuclei, or, most recently, carbon nuclei, a great number of isotopes have been produced from the six transuranium elements. The study of these isotopes' formation and properties has yielded a wealth of scientific material.

A great many, originally isolated, observations on the radioactive transmutation series were made during the work on the great plutonium project. Thanks above all to Seaborg's activities it has been possible to bring these observations together into a comprehensive wholeness. In this way there was discovered an entirely new radioactive series, which from its most long-lived member, is now called the neptunium family. The mass numbers of the three radioactive families which were previously known have the form 4n (thorium series) 4n + 2 (uranium series) and 4n + 3(actinium series). Here the neptunium series fills a gap with mass numbers of the form 4n + 1.

During his studies on the reaction of slow neutrons with thorium, Seaborg and his colleagues made a discovery which opened important technical prospects. They obtained a uranium isotope U233, which gives off x-rays and has a half-period of 120,000 years. This isotope, like U235, can be used as an atomic fuel. Thorium, which is more plentiful in nature than uranium, will therefore probably play a role as a basic material in the production of atomic energy.

The Swedish Academy of Science is of the opinion that these discoveries in the realm of the chemistry of the transuranium elements, of which I have here tried to give a brief account, are of such importance that McMillan and Seaborg have together earned the 1951 Nobel Prize for Chemistry.

Symposium: Scheduled by the American Association of Spectrographers, on "Instrumental Methods of Analysis in the Non-Ferrous Industry," in Chicago, in May. Contributed papers in this field are welcome. Please address inquiries to: Robert Raisig, chairman, Symposium Committee, c/o Apex Smelting Company, 2537 W. Taylor St., Chicago 12, Ill.

Retired: Dr. William Blum, Hon.AIC, internationally known for his contributions to the field of electrochemistry, as chief of the Electrodeposition Section of the National Bureau of Standards after forty-two years of service. He has been responsible for NBS research and development in the field of electrochemistry since 1929. He came to the NBS in 1909 and has done research in electrodeposition, including electroplating, electrotyping, and electroforming.

Dr. Blum is the author of many technical papers, of chapters in several corrosion handbooks, and of the revised third edition of the text, *Principles of Electroplating and Electroforming*. He was recently honored by the Electrodepositers' Technical Society of London, by his election as an honorary member. He is also an honorary member of the American Electroplaters' Society. He received the Medal of the Institute of Chemistry for Distinguished Governmental Service in 1926, and the Acheson Medal of the Electrochemical Society in 1944.

Private Seminar: To be held by Dr. John Gaillard, American Standards Association, for five days, January 21 through 25, 1952, in the Engineering Societies Building, 29 W. 39th St., New York, N.Y. For details write to Dr. Gaillard at 400 W. 118th St., New York 27, N.Y.

Honored: Dr. Alexander Silverman, Hon.AIC., who received a medal from Pi Lambda Phi fraternity, at the Waldorf-Astoria Hotel, New York, N.Y., November 27th, for outstanding service as teacher and scientist. He is a national honorary member of the fraternity.

On December fifth, Dr. Silverman received a certificate of merit from the Authors Club at the Arts and Crafts Center in Pittsburgh. Others honored on this occasion were Pearl Buck, author, and Otto E. Jennings, curator of biology in Carnegie Institute.

Dr. Silverman has been reappointed chairman of the Committee on Chemical Data for Ceramists of the National Research Council.

At the meetings of the International Union of Pure and Applied Chemistry held in New York and Washington this fall, Dr. Silverman was appointed vice president of the Commission on Inorganic Nomenclature for an additional two-year period.

The Rumford Medal: Awarded by the American Academy of Arts and Sciences, for 1951, to Dr. Herbert E. Ives, retired physicist of the Bell Telephone Laboratories, on November 14th. This medal, the oldest American scientific medal, was founded by Benjamin Thompson, Count Rumford, to be given for discoveries in light or heat. It has been

given to such leaders in optical science as Rowland, Michelson, and R. W. Wood.

The citation to Dr. Ives is for "his noteworthy contributions to optics", which include work on the measurement of light and color on which the present-day scientific and technical specification of the basic quantities in illumination are founded. Other contributions considered in the award were his development of the system of transmitting photographs by wire now in general use, and his pioneer work in television at the Bell Telephone Laboratories, where under his direction the first long-distance transmission of sight and sound was made, between New York and Washington, in 1927.

More recently, Dr. Ives has directed his attention to the optics of moving bodies, and has contributed a fundamental experiment in the field of the Principle of Relativity. By observations on the frequency of the light emitted by fast moving hydrogen canal rays, he has found that these "atomic clocks" run slow when in motion. This verifies a conclusion drawn by Larmor, and embodied in the Lorentz transformations as formulated by Poincare.

Expansion Project: Planned by Diamond Alkali Company at its silicate of soda plant at Dallas, Texas, to meet increased Southwest demands for more silicates for industry.

Appointed: A. J. Nydick, F.A.I.C., of New York, N.Y., by the American Board of Clinical Chemistry, Inc., as its legal counsel. Mr. Nydick received the degree of B.Sc. in chemistry from the Town Scientific School of the University of Pennsylvania. He attended the University of Pennsylvania Law School. He is a member of the New York and Philadelphia bars, specializing in chemical legal matters, particularly in patent and food and drug fields.

For many years he has been active on committees of the Philadelphia and New York sections of the American Chemical Society, and of THE AMERICAN INSTITUTE OF CHEMISTS. He is chairman of the AIC Committee on the Chemist in Public Health. He has represented various associations in matters or controversies concerning the professional independence of clinical chemists.

Alumni Luncheon: Of the University of Maine Pulp and Paper Alumni, February 19th, in the Bowman Room of the Biltmore Hotel, New York, N.Y., at 12:30 p.m. All Univers ty of Maine alumni connected with the pulp and paper and allied industries and members of the University of Maine Pulp and Paper Foundation are invited. The second annual Honor Award will be presented at this luncheon, when the name of the winner will be announced. The first award was received by Dr. Ralph H. McKee.

Stevens Institute Inaugurates President

Dr. Paul Allen, Jr., F.A.I.C.

Department of Chemistry, Stevens Institute of Technology

(The report of the AIC delegate to the Inauguration.)

STEVENS Institute of Technology, Hoboken, N.J., inaugurated Dr. Jess Harrison Davis as its fourth president, October 12th. At the ceremonies were delegates from many colleges and universities (including one from the University of Bologna, founded 1088) and from a large number of learned societies and associations. The chemical organizations represented were THE AMERICAN INSTITUTE OF CHEMISTS, the American Chemical Society, and the American Institute of Chemical Engineers.

Following registration in the morning, the delegates went to a Trustees and Faculty Luncheon. The academic procession formed shortly afterward with the delegates, faculty, trustees, and presidential party in academic costume. The new president received greetings from the Governor of New Jersey, the Mayor of Hoboken, and representatives of the groups present. In the evening all delegates were guests of the Institute at the annual Alumni Dinner.

President Davis emphasized in his inaugural address his desire to continue the Stevens tradition of a general engineering program in the undergraduate years and to expand graduate work in the various specialties. At Stevens, all students take the same course except for one subject in the senior year and one in the second semester of the junior year. All have two and a half years of chemistry and a half-year of chemical engineering; an elective in chemistry is available for seniors. In the Graduate School, the M.S. degree is given in the field of chemistry and chemical engineering.

Undergraduate work is given only during the day but nearly all the graduate work in all fields is given in the evening for the benefit of men and women working in the metropolitan area. Although Stevens does not have an undergraduate major in chemistry, it contributes in a significant degree through its graduate program to the wealth of chemical education in the New York area. Several of its staff are members and active supporters of THE AMERICAN INSTITUTE OF CHEMISTS.

Appointed: By VCA Laboratories, Newark 5, N.J. Dr. Stefan Ansbacher, F.A.I.C., as medical director.

Honored in Paris

—*Chemical Engineering Progress*

PHOTO OF PORTRAIT

A portrait of Dr. Jerome Alexander, Hon. AIC, was presented by Dr. Robert S. Aries, F.A.I.C., on December second, to the Maison de la Chimie in Paris, where it now hangs beside that of Sir Humphrey Davey and other distinguished scientists.

The presentation was featured at a meeting of the American Section of the Societe de Chimie Industrielle during the International Congress of Chemistry in Paris, held November 22nd to December second. Over two-thousand persons attended the ceremonies. Dr. Aries, consultant of New York, N.Y., and vice president of the American Section of the Societe, gave a brief summary of Dr. Alexander's achievements, particularly in the field of colloid chemistry, and then presented the portrait, which is the work of Vahan Sewny.

Dr. Alexander, consultant of New York, N.Y., is the founder of the American Section of the Societe de Chimie Industrielle and is now its Honorary Secretary. He was made an Honorary Member of THE AMERICAN INSTITUTE OF CHEMISTS on January 25, 1951. (See the February 1951 issue of THE CHEMIST, which also contains an account of his career.)

The American Section of the Societe will meet again on January 10, 1952, at the French Embassy Cultural Office, 934 Fifth Ave., New York, N.Y., where Worth Wade, president of the Section, will speak.

Research associate: Dr. Herman E. Ries, Jr., who has been appointed to this position in the Whiting Research Laboratories of Standard Oil Company (Indiana). Dr. Ries received the Ph.D. in chemistry from the University of Chicago and has been associated with the Sinclair Refining Company for the past fifteen years.

Dean: Dr. Pauline Beery Mack, F.A.I.C., who has accepted this position with the College of Household Arts and Sciences at Texas State College for Women, Denton, Texas. She was formerly at Pennsylvania State College. She is also consultant to the managing editor of *McCall's Magazine*.

Course on Detergents: To be given by the American Oil Chemists Society in cooperation with Rutgers University, July 6th to 11th. Dr. Foster D. Snell, F.A.I.C., chairman of the Committee on Arrangements, announces the following program:

July 7th, Soap Raw Materials
July 8th, Soap Processing
July 9th, Soap Properties
July 10th, Surfactants & Syndets
July 11th, Evaluation Methods.

Afternoon inspection tours of typical plants are offered for four days of the course. The fee, including room and board from late Sunday through Friday p.m., is $90. Reservations should be made through the society at 35 E. Wacker Drive, Chicago 1, Illinois, and are limited to 200.

Appointed: By the National Production Authority, Osgood V. Tracy, on leave as general manager of the Chemical Products Dept., of Esso Standard Oil Company, as deputy director of NPA's Chemical Division, where he will work with Kenneth H. Klipstein, F.A.I.C., director of the division, to achieve production goals and to distribute scarce chemicals.

Speaker: Wilfred F. White, F. A.I.C., biochemist, research division, Armour & Company, presented a paper at the International Symposium on the Chemistry of ACTH, held at the Palmer House, Chicago, September 18th.

Announced: By Dr. Joseph W. Barker, president, Research Corporation, the award of grants totaling $86,000 to forty-six scientists for basic research in academic institutions. It is the foundation's policy to assist in the expansion of the nation's scientific facilities by providing necessary equipment, materials, and other assistance to small colleges, many of which would be unable to maintain research programs.

New Division: For the manufactur of synthetic organic chemicals, formed by Pittsburgh Coke & Chemical Company. Dr. L. D. Barrick, F.A.I.C., formerly with Gulf Oil, General Aniline & Film, and Arnold, Hoffmann & Co., will be manager of the new division and director of its research and production.

Current Officers: Of The Chemical Institute of Canada, 18 Rideau Street, Ottawa, Canada, are: President: Dr. H. G. Thode, F.C. I.C.; Vice president, Dr. R. S. Jane, F.C.I.C.; Chairman, Board of Directors, R. H. Rimmer, F.C.I.C.; Treasurer, H. R. Holland, and General Manager and Secretary, Dr. Garnet T. Page, M.C.I.C.

Completed: By the Pennsylvania Salt Manufacturing Company, a new plant for the formulation of insecticide concentrates and finished products at Montgomery, Alabama.

Announced: By Charles A Thomas, Hon. A.I.C., president of Monsanto Chemical Company, the formation of an associated company, Monsanto-Kasei Kagyo, K.K., with Nipponkasei Chemical Industries, Ltd., of Tokyo, which will operate plants at Yokkaichi and Nagoya, for the production of plastics and other chemicals.

New Company: Celanese Venezolana, to produce viscose yarn and staple, was organized by the Celanese Corporation of America in cooperation with Venezuelan textile interests. Venezuelan chemists and engineers, trained in the United States in the Corporation's plants, will be employed by the new company.

Appointed: Dr. Gustav Egloff, Hon. AIC, as vice chairman of the Fund Campaign of Columbia University's new Engineering Center Development, of which Gen. Dwight D. Eisenhower is honorary chairman.

Speaker: Dr. Wayne E. Kuhn, F.A.I.C., manager of the Technical and Research Division of The Texas Company, who will discuss "Some Observations on Petrochemicals and Petrochemistry" at the meeting of the New York Section of the American Chemical Society, at the Hotel Statler, New York, N.Y., on January 11th.

Established: The Lammot du Pont Safety Awards to be presented annually by the Manufacturing Chemists' Association, 330 W. 42nd St., New York 18, N.Y., to two member companies showing the greatest improvement in plant safety over the preceding five years. Initial presentation of the awards will be made in June 1952.

Under construction: By the Gulf Oil Corporation, a multi-million dollar ethylene unit at Port Arthur, Texas, to produce nearly two and one-half billion cubic feet yearly, which will increase total U.S. production by approximately 12 per cent.

The Wise Owl Club of America: Organized nearly three years ago by the National Society for the Prevention of Blindness, 1790 Broadway, New York, N.Y., now has 1,868 industrial workers as members. Membership requires proof that the wearing of safety glasses has prevented a worker from becoming partially or completely blind. Many industrial firms have organized chapters of the Club.

Elected: By the J. T. Baker Chemical Company, Phillipsburg, N.J., two new directors. They are Ralph S. Lamie, plant superintendent, and Anthony J. Raitchek, manager, Planning and Purchasing Department.

Japan's Chemical Industry: Discussed by Dr. Donald F. Othmer, F.A.I.C., head, department of chemical engineering, Polytechnic Institute of Brooklyn, at a meeting of the Association of the Japanese Chemical Industry, in Tokyo, August 21st. He stated that the future of the chemical industry in Japan depends on the production of chemicals from petroleum specifically processed for that purpose, instead of the acetylene now in use. Japan's output of vinyl plastics was rated second only to that of the United States.

Expansion: Planned by Diamond Alkali Company at its Painesville, Ohio, Plant. The two-year, multi-million-dollar program will enable the company to increase output of caustic soda and chlorine by the electrolytic method. A new plant will also be erected to produce perchlorethylene. President Raymond F. Evans indicated that the program is expected to open additional job opportunities.

Purchasing Supervisor: Branford P. Hoffman, appointed to fill this newly-created position at Hercules Experiment Station, Wilmington, Del. Dr. Emil Ott, F.A.I.C., stated that Mr. Hoffman is being transferred to the Experiment Station to make available a skilled buyer to the research laboratories, which have greatly increased the volume of purchases.

The Defense Minerals Administration, a new agency in the Department of Interior, Washington, D.C., reviews applications for Federal assistance to aid private industry in exploiting the mineral deposits in the upper Midwest, which are essential to the defense program.

Speaker: Dr. Bernard L. Oser, F.A.I.C., director of Food Research Laboratories, Inc., Long Island City, N.Y., who addressed the Animal Nutrition Research Council, Washington, D.C., October third, on, "Are Chemicals in Feeds a Hazard—and to Whom?" Dr. Oser stressed the fact that new legislation governing the presence of chemical residues or additives in foods will affect the animal feed industry since the legal definition for food embraces food for animals as well as man.

Announced: By David W. Harris, president of Universal Oil Products Co., Chicago, the appointment of Dr. Raymond E. Schaad as technical adviser to Col. J. C. Raaen, manager of the company's laboratories at Riverside, Ill.

Author: Benjamin Levitt, F.A.I.C., of the new book, *Oil, Fat, and Soap,* published by Chemical Publishing Co., Inc., New York 10, N.Y. He is consultant to *Soap Industries,* and chief chemist of The Curley Co., Philadelphia, Pa.

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National Council Meetings

Meetings of the AIC National Council will be held at The Chemists' Club, 52 E. 41st Street, New York, N.Y., at 6:00 p.m., on the following dates:

April 9, 1952
May 6, 1952

Speaker: Dr. Foster Dee Snell, F.A.I.C., president of Foster D. Snell, Inc., New York, N.Y., who will address the sections of the American Chemical Society in Lafayette, Indiana, Bloomington, Indiana, Louisville, Ky., and Lexington, Ky., January 7th to 10th, on the subjects of Surfactants (surface active agents) and Syndets (synthetic detergents).

AIC Activities

C. P. Neidig, F.A.I.C.

Baltimore Chapter

Chairman, Dr. H. Walter Kuhl
Vice Chairman, Dr. Norris Matthews
Secretary-Treasurer, J. Bernard Edmonds
Representative to National Council, Maurice Siegel
Reporter to The Chemist, Ralph W. Lamenzo

The Baltimore Chapter held its first 1951-52 meeting at the Northway Apartments on December fifth. Professor Charles H. McBeth of Junior College, Baltimore, gave an interesting talk on "Microchemistry."

He discussed the history and progress of this new phase of chemistry which started back in 1825, but was not really recognized until Pragel further developed it in 1911. In 1912, Pragel received the Nobel prize for his work on this subject. Pragel, who was an Austrian, had as an assistant Dr. J. B. Niederl. Dr. Niederl later came to this country and furthered the modern version of microchemistry while teaching at New York University, Prof. McBeth brought out the point that Dr. Niederl aimed to make the practice of microchemistry practical and in the range of most chemists, whereas Dr. Pragel was a perfectionist who aspired to have everything at the "Nth" degree of perfection.

One of the first steps in popularizing microchemistry was the discouragement of the use of the micro-analytical balance. Now the semi-micro balance is used considerably, not only because it is less sensitive, but because it is more practical and in most cases the end results are the same. Samples of 8-10 milligrams are generally used in this method, although in Oak Ridge, Tenn., smaller samples are generally used.

This new phase of chemistry has been very helpful in biochemistry and especially in crime detection where very minute amounts of poison may be detected in brain tissue. After the talk, Prof. McBeth answered many interesting questions.

The next meeting of the Chapter will be held January 10th at Loyola College, where Dr. Bramble of Mercy Hospital will speak on the subject of coagulation of the blood.

New Jersey Chapter

Chairman, P. J. Gaylor
Chairman Elect, Harry Burrell
Secretary, Dr. H. W. Mackinney
Treasurer, Dr. E. R. Hanson
Representative to National Council, Dr. C. L. Brown

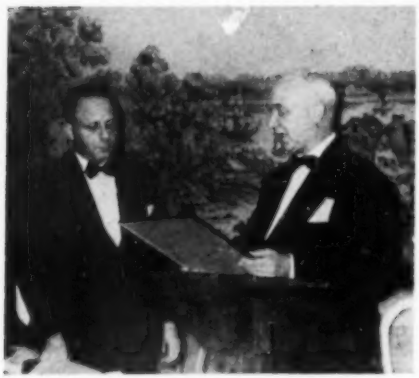
The October meeting of the New Jersey Chapter was held October 31st at the Military Park Hotel, Newark, N.J. Dr. Henry L. Cox of Corn Products Refining Company (formerly with Linde Air Products) discussed "Synthetic Gems, Their Production and Lore," a subject in which Dr. Cox' interest continues as an "extra-curricular" activity since his association with Linde.

Dr. Keith H. Butler of Sylvania Electric Products, Inc., addressed the December third meeting on "Electroluminescence." He demonstrated the wide range of colors obtainable with phosphors and pointed out that the new calcium halophosphates, which do not require beryllium, have been in use for about two years and are even more efficient than the older types. Of particular interest was the demonstration of the new "Panalescent" lamp which produces uniform illumination over a surface. Panels were exhibited which produced green, blue, and yellow tints as well as white light. Intensity of illumination increases with voltage and frequency.

Pennsylvania Chapter

Chairman, Ronald J. Baird
Chairman-elect, Adalbart Farkas
Secretary-Treasurer, John Staub
Representative to National Council, Marcus Sittenfield

Dr. Emil Ott, F.A.I.C., director of research, Hercules Powder Company, was awarded the first Honor Scroll of the Pennsylvania AIC Chapter, on December sixth, in "recognition of his distinguished services to his profession." The ceremony took place at a dinner at the Penn-Sheraton Hotel, Philadelphia. It was preceded by a reception given by Hercules Powder Company in honor of Dr.



—*Chemical & Engineering News*

Dr. Ott accepting the Pennsylvania Chapter's Honor Scroll from AIC President Flett.

Ott. Approximately one-hundred persons attended the dinner.

In presenting the Honor Scroll, AIC President Lawrence H. Flett lauded Dr. Ott for his untiring efforts to promote the free exchange of ideas among scientists.

Dr. Walter J. Murphy, Hon. AIC, editor of *Industrial and Engineering Chemistry,* spoke for the recipient, a leading authority on high polymer and cellulose chemistry.

Dr. Ott, in acknowledging the award, proposed a working creed for all scientists, based on truth, progress, and the Golden Rule. (These papers appear in the December, 1951 issue of THE CHEMIST.) Following his talk, Dr. Ott spoke extemporaneously on the development of ethical consciousness as one matures. He read pertinent excerpts from the November, 1951, CHEMIST. (Dr. Herman I. Schlesinger's article, page 472) and from "Chemistry—Key to Better Living" (Diamond Jubilee Volume, The American Chemical Society).

Among those introduced at the head table were: Adalbert Farkas, chairman-elect of the AIC Pennsylvania Chapter; Dr. Felix C. Gzemski, chairman of the Philadelphia Section of the American Chemical Society; Marcus Sittenfield, AIC national council representative; John Staub, secretary of the AIC Pennsylvania Chapter, and L. N. Bent, vice president of Hercules Powder Company and vice chairman of its Board of Directors. Ronald J. Baird, AIC Chapter chairman, presided. The chairman of the Honor Award Committee was Hillary Robinette; the chairman of the Dinner Arrangements Committee, C. P. Neidig, and the chairman of dinner reservations, Dr. V. V. Bollino.

Niagara Chapter

Chairman, Dr. Emil R. Riegel
Vice Chairman, Dr. Alvin F. Shepard
Secretary-treasurer, Dr. R. H. Schuler
Representative to National Council,
Dr. H. O. Kauffmann

The December meeting of the Niagara Chapter, AIC was held December fifth. A panel discussion, led by Dr. Walter Ericks, was held on the relationship between the local Chapter of the INSTITUTE and the Niagara Frontier Technical Societies Council. Dr. Carl Rasch, James Ogilvie, Frederick Loethen, and Frederic Sievenpiper served on the panel. After reviewing the history of the Council, suggestions were made in order to make the participation of the Chapter more effective.

Elected: Richard L. Moore, M.A.I.C., by the board of directors of Foster D. Snell, Inc., New York, N. Y., as assistant treasurer. Mr. Moore joined the organization in 1948 as assistant to the president. He received the B.S. and M.S. degrees from Bucknell University. He will continue in his capacity as director of personnel and public relations of Foster D. Snell, Inc.

Elected Vice President: J. L. Christian, by Monsanto Chemical Company, it was announced recently by Dr. Charles Allen Thomas, Hon. AIC, president.

Honorary AIC Membership Awarded to Dr. Hill

Dr. Arthur J. Hill, F.A.I.C., professor emeritus of Yale University, will be awarded Honorary AIC Membership at a meeting of the New England Chapter to be held January 24th, at the Harvard Faculty Club, Cambridge, Massachusetts, at 6:00 p.m.

Dr. John A. Timm will speak for the recipient and Dr. M. L. Crossley, Hon. AIC, will speak on Dr. Hill's professional career. The Presentation will be made by President L. H. Flett.

AIC members and other friends of Dr. Hill are invited to attend this meeting. Reservations should be sent to James W. Perry, Chemistry Dept., Mass. Institute of Technology, Cambridge 39, Mass.

Will You Come?

Jan. 17, 1952. New York Chapter. Hotel Commodore, New York. Presentation of Honorary AIC membership to Dr. John E. McKeen, F.A.I.C. Reception, 6:00 p.m., South Room, courtesy of Charles Pfizer & Co. Dinner, 7:00 p.m. Century Room. Tickets $6.50. Send reservations to Dr. A. F. Guiteras, 117 W 13th St., New York 11, N.Y.

Jan. 24th. New England Chapter. Harvard Faculty Club, Cambridge, Mass. Award of Hon. AIC Membership to Dr. Arthur J. Hill, F.A.I.C.

Feb. 1st. Chicago Chapter Presentation of Honorary AIC Membership to Dr. Ernest H. Volwiler, F.A.I.C. Details to be announced.

Feb. 7th. Pennsylvania Chapter. Engineers' Club, Philadelphia. Speaker: Dr. P. D. Foote, vice president, Gulf Oil Corp., "Middle East Petroleum."

March 22nd. New York Chapter. Student Medal Awards.

March 25th. AIC Luncheon, sponsored by the Niagara Chapter as part of the 121st National Convention of the American Chemical Society, Buffalo, N.Y. AIC members who plan to attend the Convention should send luncheon reservations to T. E. Gilbert, Bisonite Co., Inc., 125 Lakeview Ave., Buffalo 1, New York.

May 1st. Pennsylvania Chapter. Presentation of Student Medals to outstanding college seniors in area. Speaker to be announced.

May 7-8th. Annual Meeting of THE AMERICAN INSTITUTE OF CHEMISTS. Hotel Commodore, New York. Chairman of Arrangements Committee: Dr. Maurice J. Kelley, Nopco Chemical Company, Harrison, N. J.

May 22nd. Annual Meeting, New York Chapter. Program to be announced.

AIC Members who are in Washington, D.C., can find out about Washington Chapter meetings by telephoning the Chapter secretary, Paul E. Reichardt, at Republic 3275, Extension 221.

AIC Members who plan to visit New Orleans, La., are invited to get in touch with National Council Representative, Harold A. Levey, 311 Audubon Blvd., New Orleans, La.

Social Luncheon

The Niagara Chapter will hold a luncheon meeting on Tuesday, March 25th, as part of the first half of the 121st National Convention of the American Chemical Society, which will be held in Buffalo from March 23rd to March 27th. The luncheon program will be essentially social and a considerable portion of it "in the name of Ol' Lang Syne."

The Niagara Chapter would like to bring together at this luncheon meeting all of the members of THE AMERICAN INSTITUTE OF CHEMISTS who may be in Buffalo on that day. Accordingly it urges that each AIC member who plans to attend the convention so arrange his schedule that he will be at the luncheon. It is important that early reservations be made. A post card reservation is sufficient. Please send it to T. E. Gilbert, Bisonite Company, Inc., 128 Lakeview Avenue, Buffalo 1, N.Y.

Returned: C. C. Concannon,, F.A.I.C., of the U.S. Department of Commerce, Washington, D.C., who has just completed a business trip to Peru.

New Position: Robert E. Whitfield, F.A.I.C., who has joined the research department of the Dow Chemical Company, Pittsburg, Calif. He was formerly with the Calco Chemical Division of American Cyanamid.

Award of Honorary Membership

Dr. John E. McKeen, F.A.I.C., president of Charles Pfizer & Co., Inc., will be awarded Honorary AIC Membership at a dinner sponsored by the New York Chapter on January 17th, at the Hotel Commodore, New York.

John R. Brierley, F.A.I.C., president, Childs Pulp & Color Co., a traditional figure at Polytechnic Institute of Brooklyn—Dr. McKeen's alma mater — is honorary chairman of the meeting. The toastmaster is Dr. Henry B. Hass, F.A.I.C., of General Aniline & Film Corp.

Rev. James J. Pallace, S. J., F.A.I.C., of St. Peter's College, will make the Invocation.

Dr. Sidney D. Kirkpatrick, F.A.I.C., editorial director, *Chemical Engineering* and *Chemical Week*, will introduce the award recipient with a talk, "The House that Jack Built."

Dr. W. J. Murphy, editor, *Chemical & Engineering News*, *Industrial & Engineering Chemistry*, and *Analytical Chemistry*, will speak on the topic, "John".

The award of Honorary Membership will be made by AIC President Lawrence H. Flett.

Dr. McKeen's address will be titled: "Organization for Achievement."

Chas. Pfizer & Co., Inc., will sponsor the reception at 6:00 p.m. Dinner will be served at 7:00.

Opportunities

Doris Eager, M.A.I.C.

Positions Available

Chemical Engineer. Assistant to Plant Manager. Experienced in organic chemicals. Young man preferred. Northern N.J. Box 17, THE CHEMIST.

Associate Director: To assume full administrative responsibility for a large research and development department. Must be capable of directing development of organic chemical products. Metropolitan Area. Salary around $20,00. Box 19, THE CHEMIST.

Civil Service Positions

Wanted: Chemists & Physicists, who can conduct specialized investigations of fundamental problems related to the atmospheric sciences, who can plan, administer and coordinate the activities of, or who can perform research in fundamental problems related to the earth's atmosphere. Salaries range from $5,060 to $10,800 a year. Positions available at the Geophysics Research Division of the Air Force, Cambridge Research Center, Cambridge 39, Mass. Apply to Civil Service regional offices, or the U.S. Civil Service Commission, Washington 25, D.C. Request Announcement No. 1-12-1(52).

Plant for Sale in California

Chemical Plant: formerly used as distillery-winery, and manufacture of grape concentrate, etc. Located on 24-acres land, 3-million gallons concrete and wood storage, water purifying system, 600 H. P. boilers (practically new), machine shop, refrigeration equipment, pump, warehouse, two dwellings, etc. Replacement value: one-million dollars. Price 200,000. cash. Box 11, THE CHEMIST.

Balance Wanted

Student needs analytical balance. Who has good, used model at price of $40. or less? Box 111, THE CHEMIST.

Chemists Available

Chemist: B.S., Age 31, married. Member ACS, AIC. Two years experience technical sales. Desires responsible position utilizing chemical training in technical service, new product development, management. Prefer Metro N.Y., N.J. location. Box 14, THE CHEMIST.

Organic Chemist, F.A.I.C. M.S. 12 years industrial experience, research, development, production, synthetic and natural pharmaceuticals, fine organic chemicals, intermediates, in a supervisory, administrative capacity. Ideas for new compounds. Qualified for responsible production or research position. Metro. N.Y. Area only. Box 10, THE CHEMIST.

Product Wanted

Have you a small-scale, marketable organic chemical or specialty product which needs manufacturing facilities? Capital and plant with well-equipped laboratory available in Metropolitan Area. Sales service available. Box 15, THE CHEMIST.

Concerning Employment

Currently there are some 400,000 engineers in this country, and virtually all of them are working. In an expanding economy the demand for engineers is increasing, and unfortunately the supply is going down. Last spring, about 40,000 were graduated from engineering schools. Next spring, only about 27,000 will be graduated, and by 1954 this figure will drop to about 18,000, while the estimated annual demand for new engineers will stay up around 30,000. In this setting it is worth noting that the atomic energy program presently employs about 6,500 engineers of various types, and an expansion program will of course greatly increase this demand.

It is also interesting to note that of the 12,000 people in this country who have earned the right to be called physicists by the learned societies, 1,200 of them work directly for the atomic energy program. Some of these people are engaged in basic research and some in applied research. We could of course embark on a substantial expansion program without adding to our supply of

basic research people, but it would be a shortsighted kind of expansion that would have to rely to a large extent upon basic knowledge already developed. You can get bigger without basic science, but you can't go forward without basic science and any expansion program we may undertake, to be balanced, should include an enlargement of our research facilities and consequently our demand for trained scientists. And yet we cannot ignore the fact that a scientist working for us cannot also be in a university training others, or developing guided missiles for the military services, or working on a new synthetic material of value to the economy in general.

—Gordon Dean, *Chairman*, U. S. Atomic Energy Commission

Salaries of Presidents in the Processing Industries

The pay of top executives of large companies in the chemical process field varies to a surprising extent. While none of them is in the Louis B. Mayer (Loew's Inc.) half-a-million-dollar class, the yearly compensation of most presidents is over $100,000 (alas, before taxes). Here is the compensation of a few, including salary, fees, bonuses and company payments toward retirement plans (as of 1950):

American Cyanamid Company, W. B. Bell	$370,000
Union Carbide & Carbon Corp. Fred Haggerson	225,000
Republic Steel Corp., Charles M. White	314,000
Colgate-Palmolive-Peet Co., Edward Little	300,000
National Lead Co., Joseph Martino	158,000
National Distillers Products Corp., Seton Porter	325,000
Shell Oil Co., Alexander Fraser	132,000
Pittsburgh Consolidated Coal Co., George H. Love	136,000
Schenley Industries, Inc., Lewis Rosenstiel	150,000

—*Chemonomics*, publication of R. S. Aries & Associates

Graduate assistantships: Available in chemistry at Illinois Institute of Technology, Technology Center, Chicago 16, Illinois, beginning in February, June, and September. Openings are for third-time and half-time teaching and research assistants with stipends ranging from $922 to $1725 for the academic year. The chemistry department also has openings for staff positions in teaching and research.

Change of Firm Name: Standard Varnish Works, Staten Island, N.Y., to Standard-Toch Chemical, Inc., announced by M. H. Corbin, F.A.I.C., president of Standard Varnish Works and Toch Bros., Inc. The new firm now has the following divisions: Standard Varnish Works, N. Y., Standard Varnish Works, Illinois; Standard Varnish Works, California; Standard Varnish Works, Michigan; Toch Bros., Inc.; R.I.W. Waterproofing Corp.; Toch Marine Corp., and National Varnish Co., Inc.

Research Contracts: In Biology, Medicine, and Physical Research were awarded to fifteen laboratories by the U.S. Atomic Energy Commission in May. They include an award to Graham, Crowley and Associates, Chicago, where the investigator is Dr. C. A. Crowley, F.A.I.C., on "Electrowinning of Zirconium."

For Your Library

Medicinal Chemistry

Volume I. Editor: C. M. Suter, F.A.I.C. John Wiley & Sons, Inc. 1951. 473 *pp.* 6" x 9¼". $12.00.

This series of reviews, prepared under the auspices of the Division of Medicinal Chemistry of the ACS, under the editorship of Dr. Suter, will undoubtedly be welcomed by both pharmacologists and chemists concerned with the synthesis and evaluation of medicinal compounds. It contains, in easily-read form, summaries of large amounts of work already done on the compounds here presented, and indicates the type of research still needed in the field.

Six of the types of compounds most frequently used in modern pharmacology are treated in this first volume: antithyroid compounds; antispasmodics; antibiotics from plants; benzoates; analgesics: (a) aralkylamines and (b) partial structures related to morphine. In each case there is a list of all compounds that have been tested for the particular type of pharmacological activity; relationships between chemical structure and pharmacological action are discussed and methods of synthesis and pharmacologial procedures are given.

Further interest is added to the book by the references to pertinent articles in scientific journals and to the latest literature, and its practical value is insured because the reviews were written by men actively engaged in industrial research. Here is a must for the medicinal chemist.

—Dr. Frederick A. Hessel, F.A.I.C.

Advanced Organic Chemistry

Second Edition. By G. W. Wheland. John Wiley & Sons, Inc. xi + 799 *pp.* $8.00

Along with the enormous increase in the number of experimental facts being published month after month, there is fortunately a body of theory which correlates these. It is the objective of any text book of advanced Organic Chemistry to bring to the student the bulk of these theories. Each teacher of the subject must necessarily use essentially the same material. However, he is largely at liberty to use his own judgment or taste in order of presentation and in the method of exposition. Prof. Wheland's book includes most of modern organic chemistry. The first chapter is concerned with fundamental concepts and second with addition compounds. In the third chapter there is a reversion to more general chemistry in that the subject matter is the modern concept of acids and bases. In the 10th and 11th chapters, the author again reverts to more general chemistry in treating the theory of resonance and electrostatic effects in organic chemistry. The remaining chapters are directly related from the titular subject matter.

There are portions of the book in which, to this reviewer, it seems that the derivation of the theory involved is somewhat extended in the style of mathematical reasoning although mathematical formulae are not used. However, this may well be a personal reaction of the reviewer, since he found in the chapter on the theory of resonance the most illuminating explanation of wave equations that he has run across. It is certain that any student who masters this book will have a thorough knowledge of modern organic chemical theory and that any teacher using it will have little occasion to seek elsewhere for substantiating material. The book is recommended in the highest terms for the purpose indicated and for any older chemist who wishes to bring his theoretical knowledge into line with current thinking.

—Karl M. Herstein, F.A.I.C.

The Chemistry and Technology of Food & Food Products

Vol. I Editor Morris B. Jacobs, F.A.I.C. Second Edition. Interscience Publishers, Inc. 1951. *xxv* + 832 *pp.* $12.00.

The second edition of this volume has been revised and expanded. The whole work consists of three volumes. Half of the present volume contains fundamentals concerning carbohydrates, lipids, proteins, enzymes, vitamins, hormones, coloring in foods, digestion, and food spoilage. The second half of the book deals with processes and sanitary control. In this volume the editor and collaborators have well presented the basic principles of food chemistry and technology.

—Dr. Henry Tauber, F.A.I.C.

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High Molecular Weight Organic Compounds

Series: Frontiers in Chemistry, Vol. VI. Edited by R. E. Burk & Oliver Grummitt. Interscience Publishers. 1949. 340 *pp.* $6.00

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Information

"About Sugar—Its Place in Defense." Sugar Information, Inc., 52 Wall St., New York 5, N.Y.

"Directory of Biological Laboratories." Fifth Edition 1951. 164 pp. 6" x 9". $3.00 per copy. Burns Compiling & Research Organization, 200 Railway Exchange Bldg., Chicago 4, Ill.

"ESCO Process Equipment Catalog." Electric Steel Foundry Co., 2141 N. W. 25th Ave., Portland 10, Oregon.

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"Resin Guide." Information. American Cyanamid Co., Coating Resins Dept., 30 Rockefeller Plaza, New York 20, N.Y.

"American Druggist Blue Book." Drug manufacturers and addresses. 592 pp. $4.00. American Druggist Blue Book, 572 Madison Ave., New York 22, N.Y.

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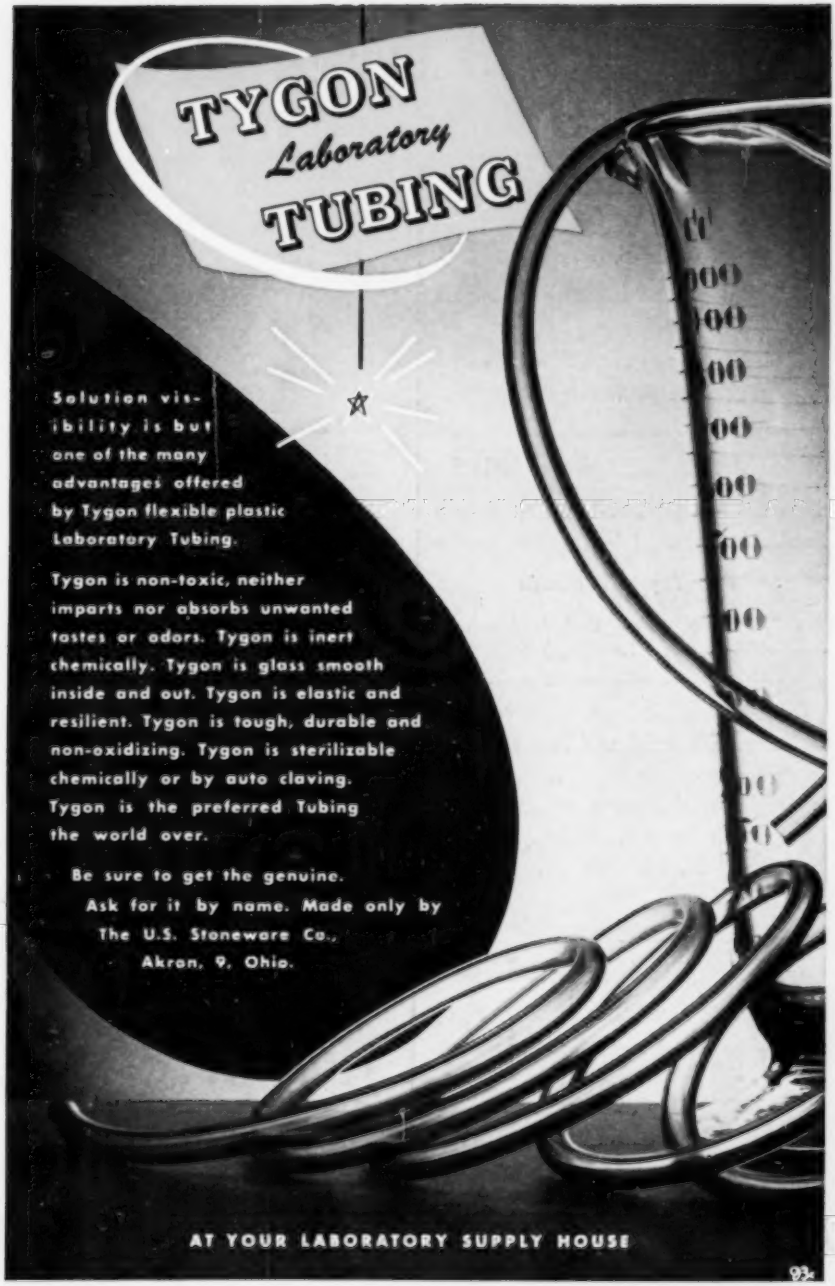
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